

[Home](#)[About us](#) | [Materials](#) | [Catalogue](#) | [Training](#) | [Knowledge](#) | [News](#)[Workshops](#)[In schools](#)**Imagine that! Arvind Gupta's active science workshop, Oct 2009**

Somewhere about half way through the workshop, I saw 14-year-old Govindraj, one of the youngest participants, showing his teacher how to make the rather complicated flexagon. You need to make a series of folds to complete this delightful math toy and many of the adult participants were having the same problems as Govindraj's teacher. 'I lost track somewhere in the middle,' she admitted sheepishly, 'but I knew that he and the other two children we have brought along with us would pick it up. Now they will teach the children in our school what they have learnt here. Frankly, we teachers have just come along as escorts.' And this, for me, was the defining moment of the workshop. Here was an example of what Arvind Gupta kept repeating throughout the day: children have an instinctive ability for math and science. Why do we take the joy out of learning by confining them to textbooks that talk so much and do so little?

'Science and math are all around us, we just fail to notice it,' rued Gupta as he demonstrated how number patterns recur in the ubiquitous calendar. The day-marker was then set aside to make way for a series of exercises in paper-folding and origami. Over a period of eight hours the 40 participants transformed from stodgy teachers to eager, excited children who delightedly applauded every one of the science wizard's many 'tricks'. Caps were made and stories told. A rectangular cap became a square hat which in turn became a box. A captain's hat became a ship which became a T-shirt. Frisky paper rabbits bounded about to the beat of little paper clappers. Then it was time for some serious mathemagic. All focus and concentration, the participants made the unending 14-page-book and the flexagon. Child's play. And what a wonderful way to explore shapes and angles!

Next came straws. Everyone was grasping at straws, though their attempts were far from futile. Propellers, pumps and reed instruments got made in minutes, and sometimes, mere seconds. Mini propellers whizzed about, water got sprayed and soon the room was filled with the sounds of little straw-reed flutes. 'This is how children learn science principles in a non-threatening manner. I have been to science labs in so many schools. They have all the fancy equipment...and everything is

locked up! But science should be accessible to children! The most expensive thing in the lab is the child's mind!' Arvind exclaimed passionately.

The resources used at the workshop were inexpensive everyday material: discarded toothpaste tubes, old film cans, cycle spokes, old rubber chappals ('I pick these up from the road and my wife feels very embarrassed. '), match sticks and matchboxes, string, ice cream sticks, safety pins, nuts, bolts and wires...Arvind's advice is to not throw anything away. Hoard, hoard, hoard. You never know when you may need the 'junk' to manufacture an instant toy.

While scientific principles and concepts lay at the core of all the activities—balance, centrifugal and centripetal force, gravity, current, electromagnetism, vibration, energy, pressure, displacement etc—Arvind forbade the use of terminology and encouraged the teachers to think like children who don't have the requisite vocabulary, but rather, an instinctive understanding of why things happen the way they do. 'Children understand by taking things apart. A toy is not a real toy unless it can be broken,' he said.

Centripetal force was demonstrated with the use of a broomstick and a piece of rubber chappal; a hangar and a five rupee coin came in handy to show the force of rotation; nails performed a balancing act on a piece of wood; vibration was a piece of paper spinning at the end of a T-pin attached to the eraser end of a pencil. Accompanying the experiments were endless anecdotes and stories, some from real life, some from mythology and some made up, that had all spellbound.

There were 40 participants in all and they included representatives from NGOs and schools. Several, like young Govindraj's group, had come from small rural and semi-rural areas in Tamil Nadu, Karnataka and Andhra Pradesh. They made over 20 science and math toys and went away with a light in their eyes and the satisfaction of lessons well learnt.

Imagine that!

Revathi Suresh

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